mistakes, which are much to be regretted, considering that they are the result of an endeavour to extend the influence of art in the direction to which we have attached so much importance, and are many of them, beautiful. Our able contemporary, the *Athenæum*, adopting much the same line of argument as that we have quoted, says, in remarking upon these "art-manufactures,"—"A cabbage-leaf in crockery, though as cunningly wrinkled as the most perfect specimen in the Margravine Sybilla of Baden's collection, makes—tried by this principle—an ineligible vegetable dish." "Nor is the most exquisitely enamelled *calla* or *datura*, convolvulus bell or honeysuckle tube, in taste when to be employed as a bouquet-holder." As regards all such things—"there is a touch of the practical joke in the best of them;"—"while we have fancy we must also have probability." "The professed design is," "to make what is convenient also beautiful. In this scheme, then, the utility comes first—the art is subsidiary. If the convenience be lost sight of, the scheme is reversed—and though things very beautiful in themselves may be produced, it is in a new intention."

We have deemed it requisite to enter thus deeply into general questions affecting what—there is much ground for hoping—will become a popular branch of art, because the works before us are not the only channels by which its salutary influences and its mercantile value have been made matters for national consideration. Much dissatisfaction as there may be still reason to feel with the present state of schools of design, much good has even now arisen from these institutions, if only in attracting the attention of many individuals to departments of art, the existence of which, as far as the public were concerned, was forgotten. The work first upon our list is that which seems of most pretension, and might, if well executed, have proved of great service: it professes to be comprised of designs selected from the best French and German ornamentalists. Though most of the representations have the appearance of selections, we are not informed where the originals are to be met with. The work is altogether very far inferior to the well-known French works, of which it is apparently an imitation: generally the selections are by no means judicious, and the drawing what we have no toleration for, in a work of this nature. Mr. Scott's preliminary essay on ornamental art, which contains a sketch of the history of design, is, however, an exception to the general character of the work, and it is only right to say that this gentleman disclaims any participation in the illustration part.—The author of the other works on furniture, has been employed in designing for Osborne House, the Conservative Club, and at other places. His work, though consisting entirely of designs, displays considerable novelty, and has a practical character which will render it more useful to decorators than many books which they are now compelled to consult. Such works, moreover, have few merits of any kind to recommend them, and even some which have been very lately published are of comparatively little service, and several in which the designs are practicable, are entirely deficient in good taste. Of Mr. Whitaker's two works, the last on the list is confined to cabinet-maker's and upholsterer's work, and includes the designs for work of this kind, previously given in the more general collection. The author is evidently an accomplished draughtsman, and has introduced many natural objects with great taste, although in the endeavour to get beauty of design, even he is not free from the common mistake of designing what, if not impracticable, would be found inconvenient to keep clean, and liable to be broken. This is the case in a conch in the "renaissance" style, where the pendant fruit and tendrils would require a good carver to execute, and even under the hand of the most careful domestic, would hardly remain entire till the end of the first week. Projecting ornaments on the front, too, which are liable to be in the way of a person sitting, are objectionable, and in the present instance the unity of the design would be greater were the ornament in question omitted.—Window cornices should, if possible, give the idea of supporting and containing the curtains which hang from them: in the house dining-room at the Conservative Club this is well managed, but in the Baron de Goldsmid's ball-room the cornice is merely festoons of leaves, from which the valance descends. The window cornice designed for Crewe Hall is called Elizabethan, but has all the outline of the Louis-Quatorze style.

In designing for furniture, to be adapted to old buildings, it is essential that there should be complete accordance of style between the building and all its accessories, but in new buildings, the extent to which good taste in design is assisted by observance of particular style, is a matter on which it is hazardous to give a hasty opinion. Mr. Whitaker has not been unsuccessful in any style, if we except the Gothic, in which he has shown us very few designs; and in comparing some of his "renaissance" designs with those which are called "Elizabethan," or with "Italian," we see how difficult it is for one individual to catch the peculiar characteristics of each, where shades of distinction are matters of nicety.

There is perhaps no article of furniture for which cabinet-makers have greater difficulty in procuring good designs, than for chairs; consequently, although plenty of designs have been published, those which can be executed have in most cases to be made in the "shop." Mr. Whitaker's designs appear, however, to be an exception, and the legs in several instances, evince really excellent taste.

In many of the designs, the author has perhaps fallen into the error to which all are so liable, viz., designing with an excess of decoration. This is objectionable, perhaps not so much on account of cost, as from the difficulty of obtaining real artist-workmen, a class which has yet to be created in England, and to whose institution we would gladly contribute.

Mr. Whitaker's works will, we think, do much to aid the efforts which are now making to improve the arts of design, and will no doubt prove acceptable to manufacturers, who are generally anxious to execute what is in good taste, but have hitherto lacked the means which the publication of a better class of books than has hitherto been in their hands, will afford them. When good principles of decorative art have become fixed, and artists properly imbued with them are numerous, we should rather urge, as in all parallel cases, that the artist be applied to in the first instance.

CONSTRUCTION OF WROUGHT-IRON BEAMS OR GIRDERS.

The construction of iron girders, especially for bridges, occupies much attention at this moment: a Government Commission of Inquiry on the subject is now sitting, as our readers know,—experiments are going on in various quarters,—and improvements are suggested every day. Cast-iron is a valuable material; but where the span is large,—great weights are to pass,—and much vibration may be expected,—caution is required in its employment as a girder.

We have often urged on the attention of Government the importance of offering premiums, with a view to improvement in the *rolling of beams*. If this were done, there is little doubt that the cost of wrought-iron girders would speedily be lessened and their use be more general.

The difficulty of making cast and wrought-iron act in concert is great: by the way in which it has up to this time been effected, harm instead of good has been done. The Government engineers, appointed to report on the failure of the Dee-bridge, said:—"That the bridge was of sufficient strength, if the cast and wrought-iron be supposed to act together,—each taking its equal proportion of the strain.

That there is great difficulty in ensuring the joint-action; and that, if this is a part of the principle of the bridge, we do not approve of it.

That neither the wrought nor the cast-iron, taken separately, was sufficient for perfect stability; and that, to have ensured this, the cast-iron girders alone should have been of sufficient strength to carry the whole weight, with an ample allowance for various circumstances which we have explained."

The Commissioners of Railways, after considering the report, from which the above is extracted, thought it their duty "to call the attention of her Majesty's Government to the uncertainty which at present exists respecting the conditions to be complied with in employing iron, but more particularly cast-iron, in engineering works. Although the facts which have been collected, and the principles which are acknowledged, may have proved sufficient for the guidance of engineers in the application of iron to works which are not exposed to an action differing materially from the steady load, yet there appears to be great doubt whether the experimental data and the theoretical principles at present known are adequate to guide them in designing iron bridges, when these are to be traversed by loads of extraordinary weight with great velocities. When exposed to the rapid motion of railway trains the structure should be capable of sustaining, without permanent injury to any part, the concussions which any irregularity may occasion, and the vibratory action which a rapid alternating change of condition must produce. The commissioners have reason to believe that much difference of opinion exists among the most eminent engineers of the present day, as to the proper form and dimensions to be given to railway girders of iron, to resist the combined action of the several forces to which they are subject during the transit of trains; and until the subject has been further investigated, they cannot be considered as having sufficient data for their secure guidance."

The uselessness of tension-rods, as usually applied, has been conclusively shewn in our pages. We look with anxiety for the result of the girder-commissioners' inquiry.

In the meantime Mr. Fielder, in conjunction with Messrs. Baker, of Stangate, has taken out a twofold patent;—first, for the construction of girders entirely of wrought-iron; and, secondly, "of girders of wrought and cast-iron riveted together, by which means (says the inventor) their co-operation is secured in a manner which the systems heretofore adverted to have evidently failed to accomplish."

One that we saw consisted of top and bottom flanges (10 inches wide and 1 inch thick), of welded plates, and a rib, 2 ft. 8 in. high and eight-twelfths of an inch thick, of three pieces, secured and riveted at the heading joints. The flanges were secured by inch rivets to the rib, by means of an angle-iron on each side, $\frac{5}{8}$ths of an inch thick. This girder, with a bearing of 31 feet 4 inches, had been subjected, it was said, to a proof of 150 tons on the centre, without injury to the elasticity of the metal, the deflection being 1 inch. 180 tons were assumed to be the breaking weight, one-half of which, or 90 tons, the patentee considers might be taken as the *working* weight.

In respect of girders made of wrought and cast-iron together, the patentee states, that he riveted to the bottom flange of a girder which had been broken in the middle, a piece of wrought-iron 8 inches by $\frac{5}{8}$ths of an inch, and then proved it to 22½ tons without injury to its elasticity. The bearing was 20 feet; the height of the broken girder was 1 foot 8 inches. Another piece of wrought-iron, 8 inches by $\frac{5}{8}$ths of an inch, was then added in the centre only, about 3 feet long, and the girder was then proved to 52½ tons.

The next experiment was upon a cast iron girder, the breaking weight of which, by Hodgkinson's rule, would be 20½ tons. "It was proved to 15 tons without loss of elasticity, and then as far as 18¾, where a permanent set of 1-16th inch took place, the total deflexion having been 7-16ths bare. Here it is supposed that the metal was in some degree injured. A wrought-iron bottom flange, 6 by ¾, which, by the patentee's rule, would be 14.1-5th tons working power, was then attached to it, and the compound girder thus created was proved to 30 tons, with the same deflexion as took place before the wrought-iron addition, with a load of 18¾ tons, but in this instance without injury to its elasticity."

We subjoin a few jottings on the subject of girders from various sources:—Captain Coddington's report on the bridges of the Trent Valley line has been before us for some time. From his description of those constructed with cast-iron girders we learn, that fifteen of these do not exceed 30 feet opening; four others vary between 35 feet and 37 feet 6 inches; every girder was proved at the foundry—the proof always extending to half the calculated breaking weight. The deflection on the largest of these girder bridges, with a tram of three of the heaviest engines coupled together, was